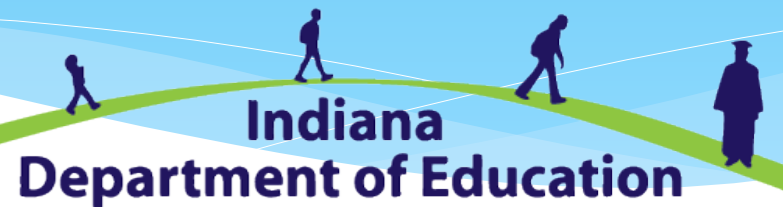


ISTEP+ Part 1 for Science

Grade 10



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Part 1: Applied Skills Items

Sample Items:

The following items are samples, designed to use with

- * teachers, as part of professional development; and
- * students, to familiarize them with items aligned to the Indiana Academic Standards for Science.

There are two types of questions on Part 1 of ISTEP+:

- * Constructed-response
- * Extended-response

Sample Item

Constructed-Response

A student is measuring the boiling point of an unknown liquid at different elevations above sea level. What would be the **BEST** way for the student to display the data she collects about how the different elevations relate to the different boiling points? Be sure to include the type of display the student should use and to describe how each important part of the display would be labeled.

Constructed-Response Rubric

Science

2-point Constructed-Response (CR) Rubric

Key elements:

- * Any response indicating that a line graph would be used AND that the title of the line graph relates boiling point temperatures to elevation above sea level;
 - * Any response indicating that the x-axis would be labeled “Elevation” with a reasonable metric unit of distance included such as meters or kilometers;
- AND
- * Any response indicating that the y-axis would be labeled “Boiling Point Temperatures in degrees Celsius.”

2 points: Response contains all three key elements

1 point: Response contains two of the three key elements

0 point: Response contains one or fewer key elements

Example 2-point response

The student will use a line graph with the title “Boiling Points of an Unknown Liquid at Different Elevations.” She will label the x-axis “Elevation (m)” and the y-axis “Boiling Point Temperatures ($^{\circ}\text{C}$).”

Example 1-point response

The student will use a line graph with the title “Boiling Points of an Unknown Liquid at Different Elevations.” She will label the x-axis “Elevation (in)” and the y-axis “Boiling Point Temperatures ($^{\circ}\text{C}$).”

Example 0-point response

The student will use a bar graph with the title “Boiling Points of an Unknown Liquid at Different Elevations.” She will label the x-axis “Elevation (in)” and the y-axis “Boiling Point Temperatures (°F).”

Sample Item

Extended-Response

A student is researching the effects of electronic waste (e-waste) on the environment. E-waste is disposing of electronics, such as cell phones, laptop computers, and other electronic products, in landfills or by burning. E-waste often contains substances, such as metals and glass, that could be used to make other products. However, e-waste also contains toxic substances that when burned or placed in a landfill can seep out into the surrounding environment and sometimes into groundwater. The amount of e-waste is expected to grow from 48.9 million metric tons in 2012 to 65.4 million metric tons in 2017.

Describe ONE way to fix the e-waste problem that will help the environment and still allow people to use electronics as much as they would like to do so.

(Item continued on next slide)

Sample Item

Extended-Response (continued)

Explain TWO ways the method you described will benefit the environment.

Describe ONE way companies that sell electronics could make reducing e-waste attractive to their customers.

Constructed- Response Rubric

Science

4-point Constructed-Response (CR) Rubric

Key elements:

First part of the question

- * Any response indicating that out-of-date electronics should be recycled.

Second part of the question

- * Any response indicating that this will reduce the amount of e-waste created;
AND
- * Any response indicating that this will reduce the cost of mining/producing the materials needed for electronics by allowing the metals and glass to be re-used instead of being mined or created.

Third part of the question

- * Any response indicating that electronics companies could offer a discount to customers who bring in old electronics to turn in when purchasing new electronics.

4 points: Response contains all four key elements

3 points: Response contains three of four key elements

2 points: Response contains two of four key elements

1 point: Response contains one of four key elements

0 point: Response contains no key elements

Example 4-point response

- * Outdated electronic devices should be recycled.
- * If outdated electronic devices are recycled, the metals and glass in them could be re-used in the making of new electronics, which would reduce the amount of mining needed for the metals. Recycling would also eliminate the problem of toxic substances from electronics that are burned or placed in a landfill seeping into groundwater.
- * Companies that sell electronics could offer a discount to customers who wish to purchase a new electronic device if the customers bring in their old electronic devices for recycling at the time of purchase.

Example 3-point response

- * Outdated electronic devices should be recycled.
- * If outdated electronic devices are recycled, the metals and glass in them could be re-used in the making of new electronics, which would reduce the amount of mining needed for the metals.
- * Companies that sell electronics could offer a discount to customers who wish to purchase a new electronic device if the customers bring in their old electronic devices for recycling at the time of purchase.

Example 2-point response

- * Outdated electronic devices should be placed in plastic bags and then placed in a landfill.
- * This would help prevent the toxic substances from old electronic devices from seeping into groundwater.
- * Companies that sell electronics could offer a discount to customers who wish to purchase a new electronic device if the customers bring in their old electronic devices wrapped up in plastic bags and turn them in at the time of purchase.

Example 1-point response

- * Outdated electronic devices should be recycled.
- * Recycling helps the environment.
- * Companies like to recycle things.

Example 0-point response

- * Outdated electronic devices should be thrown away in the trash.
- * Putting electronic devices in the trash will help the environment.
- * Companies could provide trash bags to their customers.

Questions



- * For questions on the Science 10 Item Sampler or for any content area-related concerns, please contact the Office of Student Assessment at INassessments@doe.in.gov.